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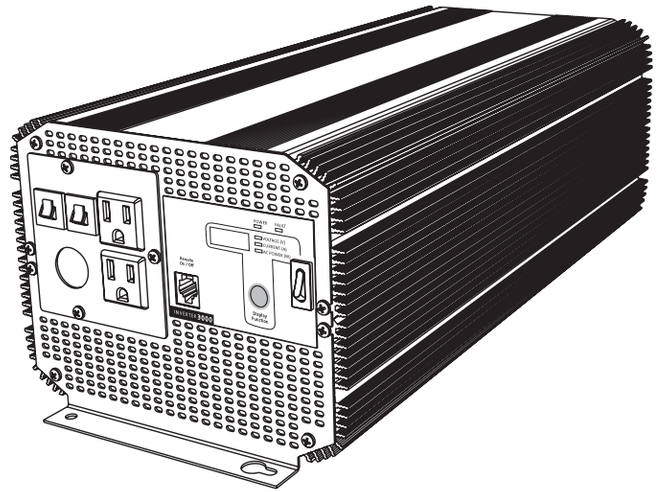
DURACELL®
INVERTER 3000



Installation Guide

This guide for use by qualified installers only.

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Date and Revision

May 2008 Revision A

Part Number

975-0445-01-01

Product Number

813-3007

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About This Guide

Purpose

The purpose of this Installation Guide is to provide explanations and procedures for installing the Duracell Inverter 3000.

Scope

The Guide provides safety guidelines, procedures for installing the inverter. It does not provide details about particular brands of batteries. You need to consult individual battery manufacturers for this information.

Refer to Duracell Inverter 3000 Owner's Guide (doc. part number: 975-0444-01-01) for operational instructions.

Audience

The Guide is intended for qualified installers including licensed technicians and electricians. It is intended for installers with knowledge and experience in installing electrical equipment, knowledge of the applicable installation codes, and awareness of the hazards involved in performing electrical work and how to reduce those hazards.

Organization

This Guide is organized into two chapters and one appendix.

Chapter 1 describes the standard features of the Duracell Inverter 3000, as well as its protection features. It also provides information on the different parts of the Duracell Inverter 3000.

Chapter 2 describes installation procedures including planning, wiring, and mounting the Duracell Inverter 3000.

Appendix A contains physical and electrical specifications of the Duracell Inverter 3000.

Conventions Used

The following conventions are used in this guide.

WARNING

Warnings identify conditions that could result in personal injury or loss of life

CAUTION

Cautions identify conditions or practices that could result in damage to the unit or other equipment.

Important: These notes describe things which are important for you to know, but not as serious as a caution or warning.

Related Information

You can find more information about Xantrex Technology Inc. as well as its products and services at **www.xantrex.com**

Important Safety Instructions

IMPORTANT: Read and save this Installation Guide for future reference.

This chapter contains important safety instructions for the Duracell Inverter 3000.

WARNING: Shock, fire, and heat hazard. Risk of injury to persons.

1. Before installing and using the Duracell Inverter 3000, read all instructions and cautionary markings on or provided with the Duracell Inverter 3000, the batteries, and all appropriate sections of this guide.
2. Do not expose the Duracell Inverter 3000 to rain, snow, spray, or bilge water. To reduce risk of fire hazard, do not cover or obstruct the ventilation openings. Do not install the Duracell Inverter 3000 in a zero-clearance compartment. Overheating may result.
3. To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition, adequately rated, and not undersized. Do not operate the Duracell Inverter 3000 with damaged or substandard wiring.
4. Do not install or operate the Duracell Inverter 3000 if it has received a sharp blow, been dropped, or otherwise damaged in any way. If the Duracell Inverter 3000 is damaged, see the Warranty section.
5. Do not disassemble the Duracell Inverter 3000. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the Duracell Inverter 3000 yourself may result in a risk of electrical shock or fire. Internal capacitors remain charged after all power is disconnected.

6. To reduce the risk of electrical shock, disconnect DC power from the Duracell Inverter 3000 before attempting any maintenance or cleaning or working on any circuits connected to the Duracell Inverter 3000. Turning off controls will not reduce this risk.
7. The Duracell Inverter 3000 must be provided with equipment-grounding conductors connected to the vehicle chassis as described in "Chassis Ground Wire Sizing" on page 2–8 and "Output Conductor Selection for Hardwire Installation" on page 2–8.

Precautions When Working With Batteries

WARNING: Explosion or fire hazard

1. Follow all instructions published by the battery manufacturer and the manufacturer of the equipment in which the battery is installed to reduce the risk of battery explosion.
2. Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during normal operation. Therefore, you must read this guide and follow the instructions exactly before installing or using your Duracell Inverter 3000.
3. This equipment contains components which tend to produce arcs or sparks. To prevent fire or explosion, do not install the Duracell Inverter 3000 in compartments containing batteries or flammable materials, or in locations that require ignition-protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system.
4. Make sure the area around the battery is well ventilated.
5. Never smoke or allow a spark or flame near the engine or batteries.
6. Use caution to reduce the risk or dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
7. If you need to remove a battery, always remove the ground terminal from the battery first. Make sure all accessories are off so you don't cause a spark.

WARNING: Risk of personal injury due to burns or battery acid

8. Remove all metal items, like rings, bracelets, and watches when working with lead-acid batteries. Lead-acid batteries produce a short circuit current high enough to weld metal to skin, causing a severe burn.
9. Have someone within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
10. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
11. Wear complete eye protection and clothing protection. Avoid touching your eyes while working near batteries.
12. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flood it with running cold water for at least twenty minutes and get medical attention immediately.

Precautions for Using Rechargeable Appliances

CAUTION: Risk of equipment damage

The output of the Duracell Inverter 3000 is not sinusoidal and may not be compatible with all loads. Follow the recommendations below.

Most rechargeable battery-operated equipment uses a separate charger or transformer that is plugged into an AC receptacle and produces a low voltage charging output.

Some chargers for small rechargeable batteries can be damaged if connected to the Duracell Inverter 3000. Do not use the following with the Duracell Inverter 3000:

- Small battery-operated appliances like flashlights, razors, and night lights that can be plugged directly into an AC receptacle to recharge.
- Some chargers for battery packs used in power hand tools. These affected chargers display a warning label stating that dangerous voltages are present at the battery terminals.

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1

Introduction

The Duracell Inverter 3000 has been designed to give you quality power, ease of use, and reliability.

Please take a few moments to read this chapter to familiarize yourself with the main performance features and protection features.

Quality Power

The Duracell Inverter 3000 is designed for use in recreational vehicles (RVs), light and heavy duty truck applications, and other in-vehicle applications.

- The inverter provides up to 2500 W of continuous power. It is designed to handle loads such as microwaves, refrigerators, freezers, circular saws, and small air compressors.
- The inverter's high surge capability lets you handle many hard-to-start loads, including large TVs, refrigerators, and freezers.
- The cooling fan in the inverter is thermally activated and comes on when the inverter becomes warm. The fan turns off automatically after the inverter has cooled.

Ease of Use

Superior features and rugged durability have been combined with ease of use:

- The inverter is compact, lightweight, and easy to install.
- Loads can be powered directly from the AC outlets.
- Easy-to-read indicators on the front panel let you monitor system performance at a glance.
- Remote On/Off switch (part number: 100-0864-01-01) lets you control the inverter from a convenient location—up to 20 feet (6 m) away—while the inverter itself is mounted out of sight.

Comprehensive Protection

The inverter is equipped with numerous protection features to guarantee safe and trouble-free operation:

Low battery alarm Alerts you if the battery has become discharged to 11.0 V or lower.

Low battery voltage shutdown Shuts the inverter down automatically if the battery voltage drops below 10.5 V. This feature will limit battery discharge.

High battery voltage shutdown Shuts the inverter down automatically if the input voltage rises to 15 V or more.

Overload and short-circuit shutdown Shuts the inverter down automatically if a short-circuit is detected in the load connected to the inverter's output, or if the loads connected to the inverter exceed the inverter's operating limits.

Over-temperature shutdown Shuts the inverter down automatically if its internal temperature rises above an acceptable level.

Features

Chapter 1, “Introduction” describes the main features of the Duracell Inverter 3000. Familiarize yourself with them before installing and operating the inverter.

AC Panel

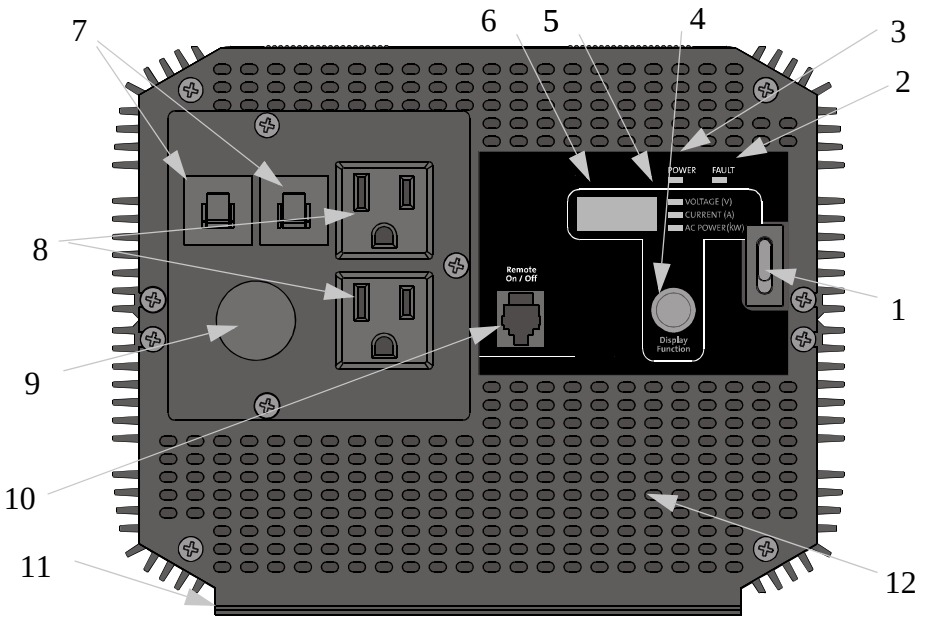

Figure 1-1 AC Panel

Feature	Description
1	**On/Off Switch** turns the inverter’s control circuit on and off. This switch is not a power disconnect switch. Disconnect AC and DC power before working on any circuits connected to the inverter.
2	**Fault light (red):** indicates the inverter has shut down due to inverter overload or over-temperature.
3	**Power light (green):** indicates the inverter is operating.
4	**Display Function Button** Press this to display battery voltage, battery current and AC output power.

Feature	Description
5	**Status indicator lights: VOLTAGE, CURRENT, AC POWER** When lit, each light indicates which status is being displayed.
6	**Status Display:** Shows Voltage, Current or AC Power. **VOLTAGE:** Indicates battery power at the input terminal of the inverter in volts (V). **CURRENT:** Indicates current drawn from the battery by the inverter in amps (A). **AC POWER:** Indicates the output power from the inverter as a percentage of total available watts (kW) being utilized.
7	**Two 15 A supplementary (overcurrent) breakers**
8	**3-Prong AC Outlets:** Each outlet is protected by a 15-amp breaker.
9	**AC Knockout:** For hardwiring the inverter.
10	**Remote On/Off Connector Port:** For connecting the Remote On/ Off Switch.
11	**Mounting Flanges (front and rear)** allow you to mount the inverter permanently.
12	**Ventilation Openings** must not be obstructed for the proper operation of the inverter. When the inverter is mounted, the ventilation opening on the DC panel must not point up or down.

DC Panel

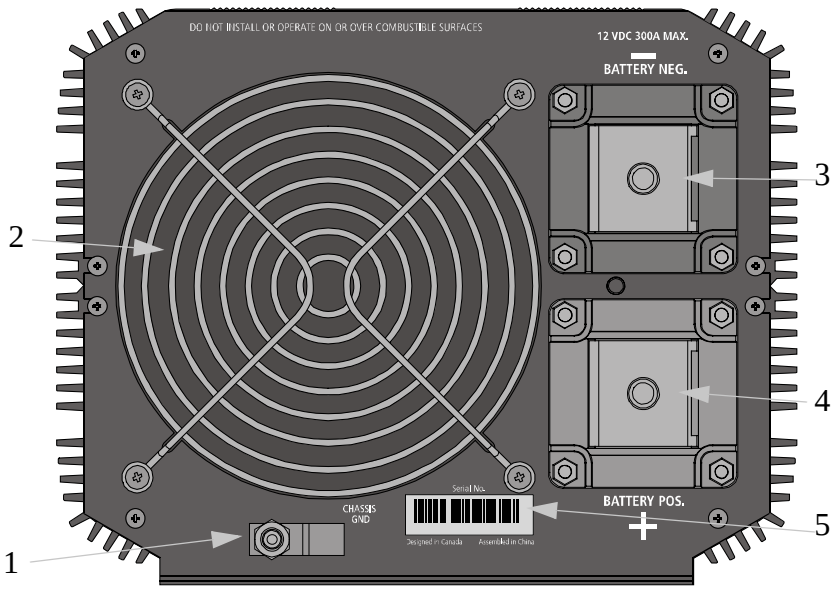

Figure 1-2 DC Panel

Feature	Description
1	**Chassis Ground Lug** connects to vehicle chassis, DC grounding bus or to engine's negative bus.
2	**Ventilation Opening** must not be obstructed for the proper operation of the inverter. When the inverter is mounted, the ventilation opening on the DC panel must not point up or down.
3	**Negative DC Cabling Terminal** always connects to the cable connected to the negative terminal of the battery.
4	**Positive DC Cabling Terminal** always connects to the cable connected to the positive terminal of the battery.
5	**Serial number** of your inverter.

Remote Switch

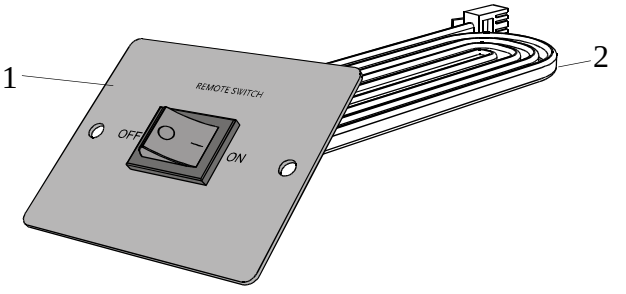

Figure 1-3 Remote Switch

Feature	Description
1	**Remote On/Off Switch** turns the inverter's control circuit on and off. This switch is not a power disconnect switch. Disconnect DC power before working on any circuits connected to the inverter.
2	**Communications Cable** is 20 feet (6 m) long.

2

Installation

Chapter 2, “Installation,” provides information on cables and fuses to help you plan for your installation and provide procedures for installing the inverter.

Read the entire chapter before beginning the installation procedures so that you can plan an installation that is suited to your power needs.

Designing Your Installation

Before doing anything else, you need to determine how you are going to use your inverter, and then design a power system that will give you maximum performance. The more thorough your planning, the better your power needs will be met. In particular, you will need to:

- Be aware of installation codes
- Calculate your battery requirements
- Choose an effective charging system
- Choose an appropriate location and mounting orientation
- Calculate the cable size for your inverter
- Select the correct fuses or circuit breakers

Study Figures “Configuration for Normal Loads” on page 2–2 and “Configuration for Heavy Loads” on page 2–2 for an example of a setup for normal or heavy loads in a vehicle. When you have decided upon your configuration, then you can calculate battery requirements.

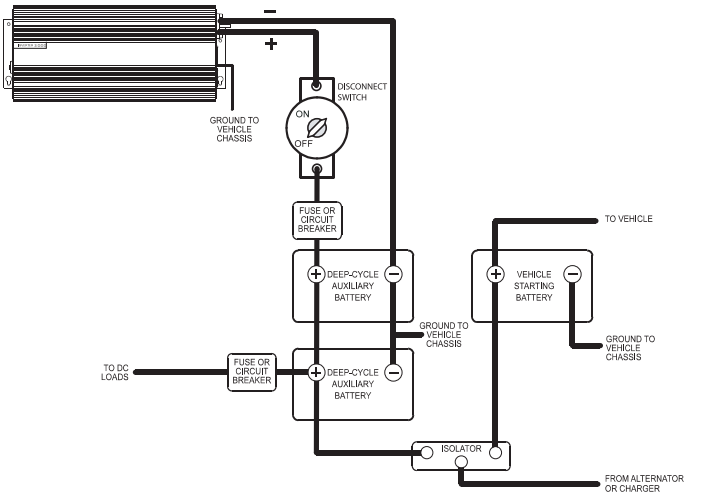

Figure 2-1 Configuration for Normal Loads

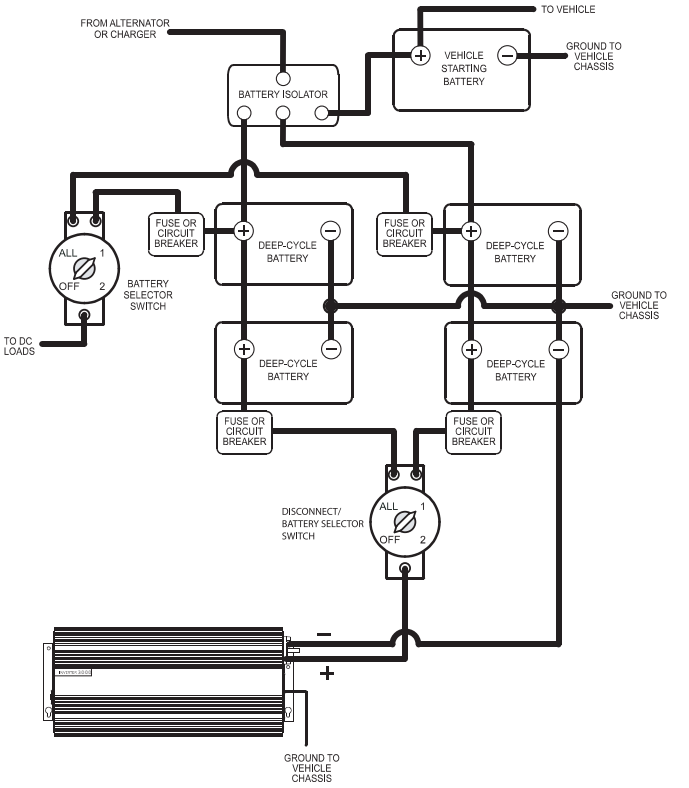

Figure 2-2 Configuration for Heavy Loads

Installation Codes

Governing installation codes vary depending on the location and type of installation. Electrical installations must meet local and/or national wiring codes and should be performed by a qualified electrician.

An example of a national wiring code is the US National Electrical Code (NEC, NFPA70) article 551 governing electrical installations in RVs. In other geographical regions or for other applications, other codes will apply. *It is the installer's responsibility to identify and apply all applicable codes.*

Calculating Battery Requirements

Battery type and battery size strongly affect the performance of the inverter. Therefore, you need to identify the type of loads your inverter will be powering, and how much you will be using them between charges. Once you know how much power you will be using, you can determine how much battery capacity you need. We recommend that you purchase as much battery capacity as possible.

For information on calculating battery capacity, go to www.xantrex.com, click “Support”, choose the product “Xpower Inverters”, and click “Battery Calculator” under Calculators & Problem Solvers.

CAUTION: Equipment damage

The inverter must only be connected to a 12 V battery system. It will not operate if connected to a 6 V battery and will be damaged if connected to a 24 V battery.

Choosing an Effective Charging System

The charging system must be appropriate for your particular installation. A well-designed charging system will ensure that power is available when you need it and that your batteries remain in top condition. Inadequate charging will degrade system performance, and the wrong type of charger will reduce battery life.

For information about choosing an effective battery charging system, go to www.xantrex.com, click “Support”, choose the product “Xpower Battery Chargers”, and click “Selecting the Right battery Charger” under Tech Notes.

NOTE: If the main charging source will be the vehicle's alternator, then its voltage and current ratings must be appropriate for the size and type of battery that is selected.

Choosing an Appropriate Location and Mounting Orientation

WARNING: Fire or explosion hazard

The inverter contains components which tend to produce arcs or sparks. To prevent fire or explosion, do not install the Duracell Inverter 3000 in compartments containing batteries or flammable materials, or in locations that require ignition-protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system.

WARNING: Fire hazard

To reduce the risk of fire, do not cover or obstruct the ventilation openings. Do not install the inverter in a zero-clearance compartment. Overheating may result.

Appropriate Location

The inverter must only be installed in a location that is:

Dry	Do not allow water or other liquids to drop or splash on it.
Cool	Ambient air temperature should be between 0 and 40ºC (32 and 105ºF)—the cooler the better within this range.
Ventilated	Allow at least 3" (76 mm) of clearance around the inverter for air flow. Ensure that the ventilation openings on each end of the inverter are not obstructed.
Safe	Do not install the inverter in the same compartment as batteries or in any compartment capable of storing flammable liquids like gasoline.
Close to battery	Do not use excessive DC cable lengths: they increase wire resistance which leads to voltage drop and heating. Consequently, they reduce available power and run-time. Longer AC wires are preferable to longer DC wires: voltage drop is less of an issue and the cost is lower.
Protected from battery gases	Do not mount the inverter where it will be exposed to gases produced by batteries. Battery gases are corrosive, and prolonged exposure to battery gases will damage the inverter.

Mounting Orientation

The inverter must be oriented in one of the following ways:

- Horizontally on a vertical surface. (Do not mount with the fan pointing up or down.)
- On a horizontal surface.
- Under a horizontal surface.

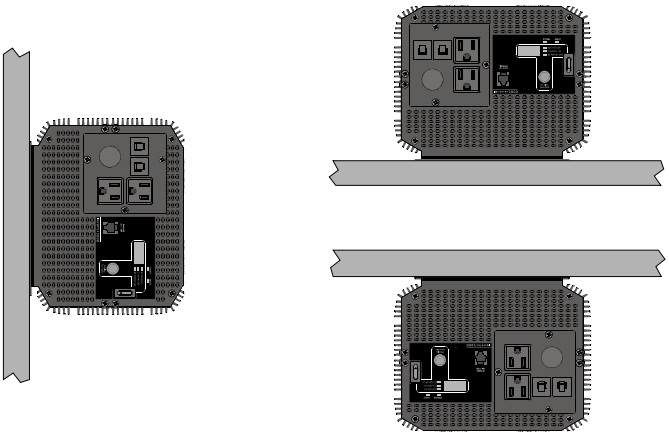

Figure 2-3 Approved Mounting Orientations

Mounting Dimensions

Use the measurements below to plot the holes in the surface where you want to anchor the inverter and permanently mount it into place.

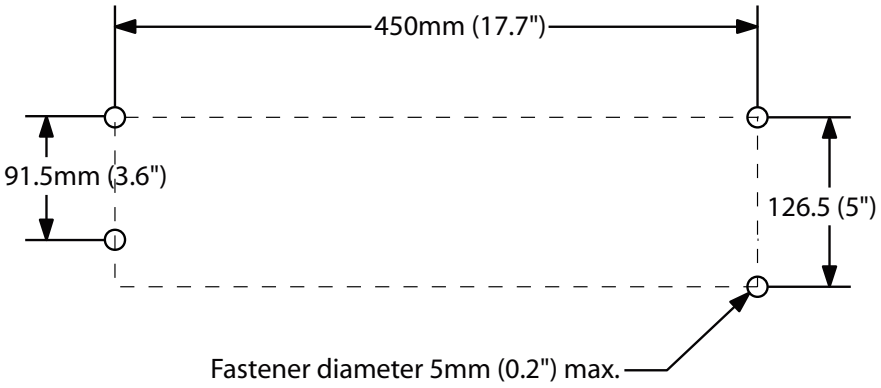

Figure 2-4 Mounting Dimensions (Not to scale)

Selecting Cable Sizes

To operate safely and effectively, the Duracell Inverter 3000 needs proper cables and fuses. The Duracell Inverter 3000 has low-voltage and high-current input, so it is essential that you use low-resistance wiring between the battery and the inverter. This means using the largest gauge and shortest DC cables. The goal is to deliver the maximum amount of usable energy to your load.

For safe and efficient operation, you will need to calculate cable sizes for your:

- DC input cables from the battery to inverter, and
- Chassis ground cable from the vehicle chassis to the chassis ground lug on the inverter's DC panel.

WARNING: Fire hazard

Use only copper wire rated 90 °C minimum. Never use a DC input cable longer than specified in "DC Input Cables" below. A longer cable can potentially generate enough heat to start a fire or result in poor inverter performance.

DC Input Cables

- Keep all cables as short as possible, and ensure that each cable between the inverter and the battery is no longer than 10 feet (3 m).
- Do not use aluminum cable. It has about 1/3 more resistance than copper cable of the same size, and it is difficult to make good, low-resistance connections to aluminum wire.
- Some installation codes require and we recommend use of oil-resistant cable rated for damp or wet locations.
- For installations subject to the US NEC, the minimum cable size required is 75C, No. 4/0 AWG with a maximum fuse size of 400 Adc[1]
- For other installations, other codes may apply, but in no case should you use DC cables smaller than No. 2/0 AWG, protected by a 250 Adc fuse, but note that the five-minute 3000 W rating requires a 350 Adc fuse, which will require a minimum No. 4/0 AWG cable.

1.Based on US NEC, 2008, table 310-17, 75C copper wire.

Selecting a DC Input Fuse or Circuit Breaker

The DC cables from the battery to the inverter need to be provided with overcurrent protection, in the form of a fuse or circuit breaker, located as close as possible to the DC positive battery terminal.

Because your batteries can provide thousands of amps of short-circuit current, you need a DC-rated fuse or circuit breaker that can safely interrupt the short-circuit current that the batteries can produce.

DC Disconnects and Over-Current Devices

The DC circuit from the battery to the inverter must be equipped with a disconnect and over-current device. This usually consists of a circuit breaker, a “fused-disconnect,” or a separate fuse and DC disconnect. Do not confuse AC circuit breakers or fuses with DC-rated ones. They are not interchangeable. The rating of the fuse or breaker must be matched to the size of cables used in accordance with the applicable installation codes. The breaker or disconnect switch and fuse should be located as close as possible to the battery, in the positive cable. Applicable codes may limit how far the protection can be from the battery.

To select the correct fuse type and size:

1. Determine the total short-circuit current rating for each battery, based on the battery manufacturer's published short-circuit current sourcing ratings for the battery. Then determine the total for your battery bank. For example:
   - If you are using one battery to power your inverter and its short-circuit current rating is 500 A, the total short-circuit current rating is 500 A.
   - If you are powering your inverter with two 12 V batteries connected in parallel, and each battery has a short-circuit current rating of 500 A, the total short-circuit current rating is 1000 A.
   - If you are powering your inverter with two 6 V batteries connected in series, and each battery has a short-circuit current rating of 500 A, the total short-circuit current rating is 500 A.

Important: For batteries connected in parallel, the total short-circuit current rating is the sum of the short-circuit current ratings of all of the batteries connected in parallel. For batteries connected in series, the total short-circuit current rating is equal to the short-circuit rating of the battery with the highest short-circuit rating. It is not the sum of all the short-circuit current ratings taken from each connected battery.

2. Once you have determined the total short-circuit current rating of your batteries, select a fuse or circuit breaker that has:
   - a short-circuit interrupting capacity at least equal to the total short-circuit current rating of your battery bank, and
   - a DC voltage rating of at least 16Vdc, and
   - a current rating no more than the values given above.
3. If a fuse is used rather than a circuit breaker, a disconnect switch located between the battery and the fuse is recommended, to allow the circuit to be de-energized when replacing the fuse.

   Fuses and circuit breakers can be bought at any marine electrical supply store, RV supply store, or electrical products store.

Chassis Ground Wire Sizing

Connect a minimum No. 8 AWG[1] copper wire from the vehicle chassis to the chassis ground terminal on the inverter DC panel.

Output Conductor Selection for Hardwire Installation

The inverter may be used by connecting cord-connected loads to the receptacles on the front panel, and/or by connecting loads or a load circuit to the AC output hardwire terminal block. If making connections to the AC output hardwire terminal block, use jacketed No. 10 AWG[2] copper 2-wire plus ground cable. Conductors may be solid or stranded.

Some installation codes require and we recommend use of oil-resistant cable rated for damp or wet locations.

Color code for conductors:

Black = [L]ine (hot)

White = [N]eutral

Bare or green = [G]round

1.Based on US NEC 2008 article 551-20(c). Other codes may require larger chassis ground cable, in some cases as large as the DC power cables.
2.Based on US NEC 2008, table 310-16, 75C copper wire.

Installing the Inverter

Do not proceed with the installation of your inverter until you have read the section, “Designing Your Installation” starting on page 2–1. The more thorough your planning, the better your power needs will be met to achieve maximum performance from your inverter.

Safety Instructions

Before you start to install the inverter:

- Review the “Important Safety Instructions” on page v.
- Read and follow all Warnings and Cautions in this chapter.

Installation Tools and Materials

Tools

- Wire stripper
- Wrench for DC terminals
- Screwdrivers (Philips, slotted)
- Crimping tool for fastening lugs and terminals on DC cables. NOTE: You may find it more convenient to have the crimp connectors installed onto the DC cable by the store that sells you the cable and/or connectors.
- Hex key screwdriver, if set-screw type "box lugs" are used.

Materials

The following checklist is a general list of required materials.

- Four corrosion-resistant fasteners sized #10 or larger for mounting the inverter
- Copper DC input cable as selected in “DC Input Cables” on page 2–6.
- Two 5/16" hole size ring terminals or box lugs, sized for the cable gauge selected to connect the DC cables to the DC input terminals
- Lugs and terminals to connect the DC cables that connect to the battery fuse holder and disconnect switch
- DC fuse(s), fuse holder, and disconnect switch, or DC circuit breaker, as selected in “Selecting a DC Input Fuse or Circuit Breaker” on page 2–7.

- Copper chassis ground cable, as selected in "Selecting Cable Sizes" on page 2–6.
- AC output cable (if using the hardwire terminals)
- Battery isolator (if connecting to a multiple-battery system)
- Two provided DC terminal covers[1]
- Battery selector switch[2]
- Alternator controller[2]
- High-output alternator[2]

Overview of Installation Steps

These are the five steps for installing your inverter. Do not proceed with installation until you have read "Designing Your Installation" starting on page 2–1.

1. Install the Remote On/Off Switch.
2. Mount the inverter.
3. Connect the chassis ground.
4. Connect AC output (if connecting to an existing AC circuit).
5. Connect the DC cables.

Installing the Remote On/Off Switch

The Remote On/Off switch can be plugged into the remote switch jack on the front of the inverter. The remote switch lets you turn the inverter on and off from a convenient location—up to 20 feet (6 m) away from the inverter.

1.Negative DC terminal black cover (part number: 064-3001-01), Positive DC terminal red cover (part number: 064-3002-01)
2.Optional equipment only. Use as needed by your specific installation.

Mounting the Inverter

Do not mount the inverter under the hood of your vehicle. See “Choosing an Appropriate Location and Mounting Orientation” on page 2–4.

To mount the inverter:

1. Make sure the On/Off switch is in the Off position.
2. Select an appropriate mounting location and orientation as recommended in “Choosing an Appropriate Location and Mounting Orientation” on page 2–4.
3. Using the measurements found above in “Mounting Dimensions” on page 2–5, mark the positions of the mounting screw holes in the mounting surface where the inverter is to be permanently placed.
4. Pilot drill the four mounting screw holes.
5. Fasten the inverter to the mounting surface using corrosion-resistant fasteners sized #10 or larger.

Connecting the Chassis Ground

The inverter has a lug connector labelled **CHASSIS GND** on the rear panel as shown in Figure 2-5. This lug is used to connect the chassis of the inverter to your vehicle chassis or system’s DC grounding point as required by regulations for some installations.

Do not use the DC ground lug for your AC grounding.

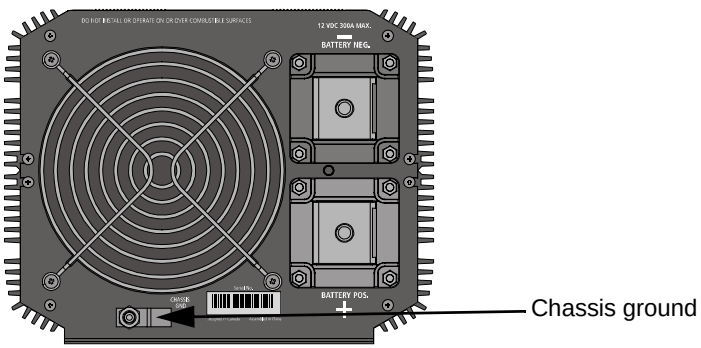

Figure 2-5 Chassis Ground Location

WARNING: Shock and fire hazard

Never operate the inverter without properly connecting the chassis ground.

You must connect the inverter chassis ground terminal to a grounding point. Use a No. 8 AWG copper wire that is bare or provided with green insulation and connect it between the inverter chassis ground lug and the vehicle's DC grounding point (usually the vehicle chassis or a dedicated DC ground bus).

To connect the cable to the chassis ground lug:

1. Make sure the inverter's On/Off switch is in the Off position.
2. Loosen chassis ground lug screw using a screwdriver.
3. Strip 3/8" (9.5 mm) of insulation from one end of the cable.
4. Place one end of the cable into the ground lug.
5. Tighten the chassis ground lug to a torque of 26.5–28.7 ft-lbs (36–39 Nm).

Connecting the AC Output

You can plug your AC loads directly into the receptacle on the inverter front panel. Output power to each receptacle is limited by a circuit protector rated at 15 A.

You can also hardwire (permanently connect) the AC output using the AC knockout. This is intended for connection of a load sub-panel or additional AC outlets powered by the inverter.

Important: This connection must be made in accordance with applicable electrical codes. If you are not a qualified electrician, we recommend that you let a qualified electrician install this product.

WARNING: Fire and shock hazard

For protection and control, install a branch-circuit rated breaker between the inverter and the load wiring, receptacles, and loads.

The Inverter 3000 will not operate a combination of high-power electrical appliances that consume a total of more than 2500 watts (continuous operation) or a total of more than 3000 watts (five-minute operation).

WARNING: Shock hazard

If AC outlets are connected to the inverter AC hardwire terminal, the outlets must be GFCI-protected.

For a list of Xantrex-tested and approved GFCIs and for more information about GFCIs, see the application note “Using GFCI Receptacles on Xantrex Inverters and Inverter/Chargers” in the Document Library at **www.xantrex.com**.

WARNING: Shock hazard

Make sure wiring is disconnected from all electrical sources before handling.

WARNING: Shock hazard and risk of equipment damage

Do not connect an AC source (such as a generator or utility power) to the AC wiring output of the Inverter 3000.

The Inverter 3000 will not operate if its output is connected to AC voltage from another source, and potentially hazardous or damaging conditions may occur. These conditions can occur even if the inverter is off. If installing the inverter in a system with another AC source (utility power or generator), an approved and suitably rated break-before-make AC transfer switch must be installed

To make the AC output wiring connections:

1. Disconnect all DC and AC power sources from the Inverter 3000.
2. Install a dedicated AC load panel or an additional circuit breaker in an existing AC load panel.
   This circuit breaker must have a current rating based on the load current the circuit will carry, and must be rated for 120 Vac branch circuits. For installations subject to the US NEC, the required breaker size is 30 A based on No. 10 AWG (using 75 °C minimum wire) and the 2500 W continuous output rating of the inverter.
3. Remove the AC wiring knockout from the Inverter 3000 AC panel.
4. Remove the screws securing the Inverter 3000 AC panel.

5. Locate the terminal wires which are all terminated with a vinyl insulated butt splice connector.

   The output wires are colored white for (N)eutral, black for (L)ine, and green (or bare) for (G)round.

6. Run the AC output cable through the knockout, and through an appropriate strain-relief device.
7. Insert the ground (bare or green) wire into the butt splice connector for the ground terminal.
8. Insert the Line (black) and Neutral (white) wires into the butt splice connector for Line and butt splice connector for Neutral terminals, respectively.
9. Secure and permanently attach each of the wires (L, N, and G) using a butt splice connector crimping tool.

   NOTE: Once the wires are crimped and secured, they cannot be detached without cutting the wires, thus, you can only make these connections one time.

WARNING: Shock hazard

Exposed and uncapped wires are a shock hazard. If you cut the wires after permanently connecting the AC output wires make sure that you terminate the wires with a proper wire cap terminal.

10. Complete the installation of the strain-relief device.
11. Replace the Inverter 3000 AC panel and secure the panel into place using the screws from step #4.
12. Connect the outgoing AC wires to the AC load panel.

Connecting the DC Cables

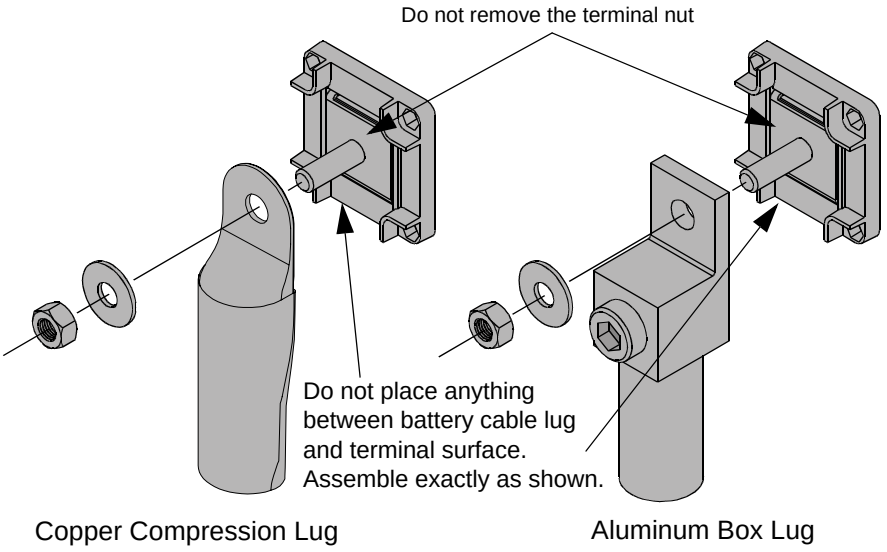
Do not remove the terminal nut
Do not place anything between battery cable lug and terminal surface. Assemble exactly as shown.
Copper Compression Lug
Aluminum Box Lug

Figure 2-6 DC cable lug examples

Consult Figure 2-1, “Configuration for Normal Loads” on page 2–2, or Figure 2-2, “Configuration for Heavy Loads” on page 2–2 for additional details that are specific to your installation.

To make the DC connections:

1. Cut the cables to the correct length with enough insulation stripped off so you can properly install the type of terminals you will be using.

   The terminals on the DC end are designed to fit up to 500 MCM crimp-on ring terminals (either AMP or ILSCO) or box connectors.

2. Attach the connectors to both cables.

   If using compression lugs, attach the terminals to both cables using the crimp tool recommended by the manufacturer of the ring terminals. **There must be no stray wire strands protruding from the terminal.** If using box lugs, attach the lug to the Duracell Inverter 3000 first, then insert the wire and tighten the set screw to the torque recommended by the lug manufacturer.

3. Route the DC supply cables from the battery bank to the inverter.

4. Install a fuse and disconnect switch or breaker between the inverter and the battery. Ensure that the disconnect switch or breaker is turned off before installing. They must be installed in the positive side of the DC circuit, as close as possible to the battery. This protects your battery and wiring in case of accidental shorting. See “Installing the Inverter” on page 2–9.
5. Attach one connector on the positive cable to the positive DC terminal on the DC end, and then attach the other connector to the POSITIVE (+) terminal on the fuse or breaker.

CAUTION: Reverse polarity

DC power connections to the inverter must be positive to positive and negative to negative. A reverse polarity connection (positive to negative) will blow a fuse in the inverter and may permanently damage the inverter. The fuse is not user replaceable and the inverter may need to be returned for servicing.
Damage caused by a reverse polarity connection is not covered by your warranty.

Observe the polarities carefully while completing the installation. Use a wrench to tighten to a torque of 216–240 inch-pounds (24–27 Nm). Test that the cable is secure.

CAUTION

Do not over-tighten the nut on the DC input terminals. Damage to the DC input terminals may result.

CAUTION

Do not remove the terminal nut.

CAUTION

Loose connections cause excessive voltage drop and may cause overheated wires and melted insulation.

6. Connect one connector on the negative cable to the negative terminal on the DC end. Before proceeding, check that cable polarity is correct, and then connect the other end of the cable to the NEGATIVE (–) terminal on the battery.

   This is the last cable connection you make. If the disconnect switch or breaker is not turned off, a spark is normal when the connection is made. Use a wrench to tighten to a torque of 216–240 inch-pounds (24–27 Nm). Test that the cable is secure.

7. Attach the DC terminal covers.
8. Before proceeding, double check that you have connected the cables properly—positive to positive, negative to negative.
9. Turn on the battery disconnect switch or breaker.
10. If you have installed a battery selector switch, use it to select one of the batteries or battery banks (house bank preferred over start bank).
11. Move the inverter's On/Off switch to the On position.
12. Check the input voltage display. It should read between 12 and 13 V, depending on the condition of the battery. If it does not, check your battery and the connection to the inverter, and the state of charge of the battery.
13. Test sample loads by plugging appliances into the AC receptacles and check to see if they work properly.
    Alternatively, if a load sub-panel or additional AC outlets are hardwired into the inverter AC output, test that appliances plugged into the additional outlets are working properly.

A Specifications

Appendix A contains electrical performance and physical specifications for the inverter.

Important: Specifications are subject to change without notice.

Electrical Performance

Output power at 25ºC (77ºF) ambient temperature and 12 Vdc input: • Maximum continuous output power • 5 minute rating	 2500 W 3000 W
Output power at 40ºC (104ºF) ambient temperature and 12 Vdc input: • Maximum continuous output power	 1900 W
Output current: • Maximum continuous output • 5 minute rating	 20 Adc 25 Adc
Output voltage range	120 Vac RMS ± 10%
Output waveform	Modified sine wave
Output frequency	60 Hz
Input voltage range	10.5–15 Vdc (12.0 Vdc nominal)
Input current: • Maximum continuous output • 5 minute rating	 260 A 300 A
Low battery alarm	11.0 V
Low battery cutout	10.5 V
Peak efficiency	90%
No load current draw (switch is on)	<0.6 Adc

Physical Specifications

Length	18 1/2" (47 cm)
Width	8" (20 cm)
Height	6 1/4" (16 cm)
Weight	20 lb. (9 kg)

Accessory

Remote On/Off switch with 20-foot communications cable	Part number: 100-0864-01-01